CLAIMS

What is claimed is:

[c1] 1. An apparatus for directing laser energy to a plurality of targets in multiple fields of view, and receiving the scattered returns therefrom, comprising:

a plurality of condensing optical elements for collecting said scattered returns,

a plurality of windows for allowing said laser energy to pass therethrough;

an optical enclosure being formed from a combination of said condensing optical elements and said windows;

a multiple-axis scanning mirror positioned to receive a laser beam, said multiple-axis scanning mirror directing said laser beam into one or more predetermined scan patterns; and

a fold mirror with patterned aperture positioned to intercept the laser scan pattern, from said scanning mirror, said fold mirror mirror directing a first portion of said laser scan pattern along a first field of view and a second portion of said laser scan pattern along a second field of view.

[c2] 2. The apparatus in accordance with claim 1 wherein said multiple-axis scanning mirror is located within said optical enclosure and receives said laser beam through an aperture in said optical enclosure.

[c3] 3. The apparatus in accordance with claim 1 wherein said fold mirror further comprises:

a transmissive central region passing said first portion of said laser scan pattern therethrough; and

a periphery deflecting said second portion of said laser scan pattern in a direction along said second field of view.

[c4] 4. The apparatus in accordance with claim 1 further comprising a plurality of detectors, each detector converting said scattered returns collected from a respective condensing optical element into electrical signals.

[c5] 5. The apparatus of claim 1 wherein said condensing optical element is selected from the group consisting of imaging optical elements, non-imaging optical elements, reflective optical elements, refractive optical elements, diffractive optical elements, and holographic optical elements.

[c6] 6. The apparatus of claim 1 wherein said periphery includes a light directing element selected from the group consisting of reflective elements, refractive elements, diffractive elements, and holographic elements.

[c7] 7. The apparatus of claim 1 wherein said transmissive central region is selected from the group consisting of a physical hole, a holographic element, a partially-transparent refractive element, and a substantially-transparent refractive element.

[c8] 8. The apparatus of claim 1 wherein said fold mirror is tilted at a predetermined angle with respect to the laser energy from said scanning mirror.

[c9] 9. The apparatus of claim 8 wherein said fold mirror with patterned aperture comprises a plurality of holographic optical elements.

[c10] 10. The apparatus of claim 8 wherein said fold mirror with patterned aperture comprises one or more electrically switchable holographic optical elements.

[c11] 11. A laser scanner for directing laser energy to a plurality of targets in multiple fields of view, and receiving the scattered returns therefrom, comprising:

a plurality of condensing optical elements for collecting said scattered returns,

a plurality of windows for allowing said laser energy to pass therethrough;

an optical enclosure being formed from a combination of said condensing optical elements and said windows;

a multiple-axis scanning mirror located external to said optical enclosure and positioned to receive a laser beam, said multiple-axis scanning mirror directing said laser beam through an aperture into said optical enclosure and forming a laser scan pattern therefrom;

a fold mirror with patterned aperture located within said optical enclosure and positioned to intercept the laser scan pattern, said fold mirror comprising,

a transmissive central region passing a first portion of said laser scan pattern therethrough in a direction substantially along a first field of view, and

a periphery deflecting a second portion of said laser scan pattern in a direction along a second field of view; and

a plurality of detectors, each detector located proximal to said optical enclosure to convert said scattered returns collected from a respective condensing optical element into electrical signals.

[c12] 12. The laser scanner of claim 11 further comprising beam expansion optics.